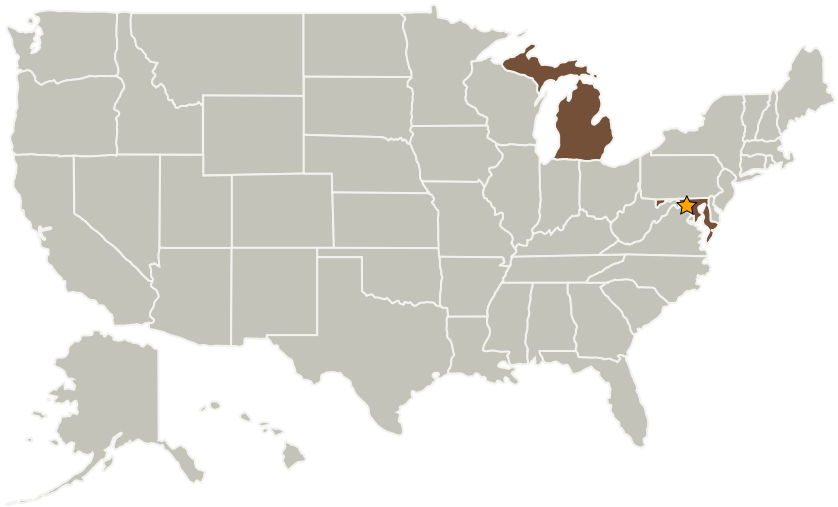
Robust CCSDS Image Data to JPEG2K Transcoding, Phase I

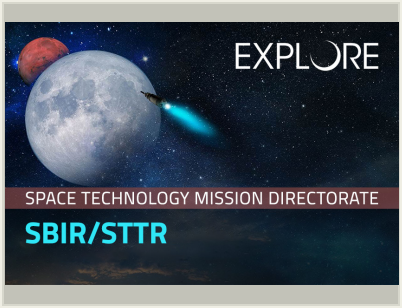
Completed Technology Project (2006 - 2006)

Project Introduction

Images from space satellites, whether deep space or planetary, are often compressed in a lossy manner to ease transmission requirements such as power, error-rate, and data stream size. These requirements differ from standard computer image processing requirements since storage space, processing speed, and power constraints differ between PCs and satellites. To facilitate use of satellite images in other applications such as data dissemination, image analysis, image storage and retrieval, etc., a method is needed to convert satellite images to a more widely supported format. However, since many formats lose information ("lossy" compression), too many transcodings, poorly performed transcodings, or transcodings between poorly chosen formats will degrade image quality, sometimes making them useless. Images such as military photos and deep space objects require high quality, so it is desirable to avoid or minimize loss during transcodings. NASA has requested software transcoding from the CSSDS Image Data Compression recommendation to JPEG2000 with minimal image degradation. This proposal shows how Cybernet will approach this conversion, obtaining a minimal or zero loss in image fidelity, through mathematical analysis and careful software construction. This will be shown to be possible due to the specific wavelet compression techniques used in the two formats.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Cybernet Systems Corporation	Supporting Organization	Industry	Ann Arbor, Michigan

Primary U.S. Work Locations	
Maryland	Michigan

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX10 Autonomous Systems
  - TX10.1 Situational and Self Awareness
    - TX10.1.3 Knowledge and Model Building